REMARKS

The Office Action dated July 28, 2003, has been received and carefully considered. In this response, claims 1 and 8 have been amended, and replacement drawings for Figures 5A-5D and 8 have been added. Entry of the amendments to claims 1 and 8 and the replacement drawings for Figures 5A-5D and 8 is respectfully requested. Reconsideration of the outstanding objections/rejections in the present application is also respectfully requested based on the following remarks.

I. THE OBJECTION TO THE DRAWINGS

On page 2 of the Office Action, the corrected drawings submitted April 21, 2003, were approved by the Examiner, but remain objected to until replacement drawings are submitted.

Replacement drawings for Figures 5A-5D and 8 were submitted with the Office Action response filed April 21, 2003.

In view of the foregoing, it is respectfully requested that the aforementioned objection to the drawings be withdrawn.

II. THE TERMINAL DISCLAIMER AND THE DOUBLE PATENTING REJECTION

On page 2 of the Office Action, the Examiner indicates that the terminal disclaimer filed April 21, 2003 has not been accepted. The reasoning behind the Examiner's non-acceptance is

unclear. However, submitted herewith is a terminal disclaimer which properly indicates the current ownership of the present application, which was incorrectly stated in the terminal disclaimer filed April 21, 2003.

Approval of the presently filed terminal disclaimer, as well as the withdrawal of the double patenting rejection, is respectfully requested.

III. THE OBVIOUSNESS REJECTION OF CLAIMS 1, 4-6, 8, AND 11-13

On pages 3-4 of the Office Action, claims 1, 4-6, 8, and 11-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Keyworth et al. (U.S. Patent No. 6,134,359) in view of Ogusu et al. (U.S. Patent No. 5,799,118). This rejection is hereby respectfully traversed.

As stated in MPEP § 2143, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed

combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Also, as stated in MPEP § 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Further, as stated in MPEP § 2143.01, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). That is, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970). Additionally, as stated in MPEP § 2141.02, a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead

away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). Finally, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Regarding claim 1, the Examiner asserts that Keyworth et al. teach the present invention substantially as claimed, except that Keyworth et al. fail to teach that the coefficient of thermal expansion (CTE) of the diffraction grating is a value chosen to be approximately equal to a negative of a change of index of refraction with temperature of air. The Examiner goes on to assert that Ogusu et al. teach a coefficient of thermal expansion (CTE) of a diffraction grating having a value that is chosen to be approximately equal to a negative of a change of index of refraction with temperature of air, and thus it would have been obvious to combine the teachings of Keyworth et al. and Ogusu et al. so as to arrive at the present invention as claimed.

Applicants respectfully disagree with the Examiner's assertions. Specifically, Applicants respectfully submit that Ogusu et al. fail to claim, disclose, or even suggest choosing a coefficient of thermal expansion (CTE) for a diffraction grating that is approximately equal to a negative of a change of index of

refraction with temperature of air. Instead, Ogusu et al. teach that "to reduce the temperature dependency of the wavelength transmission characteristic it is required that the diffraction grating be made of material which has a small thermal expansion coefficient and be placed in a medium whose refractive index changes only a little" (see column 3, lines 9-13). Thus, Ogusu et al. teach that there are separate requirements for the diffraction grating (i.e., that it have a small coefficient of thermal expansion) and the medium surrounding the diffraction grating (i.e., that it have a refractive index that changes only a little). Nowhere do Ogusu et al. teach of a direct equal but opposite relation between the coefficient of thermal expansion (CTE) value of a diffraction grating and the refractive index value of air. The Examiner further asserts that Ogusu et al. specifically teach of such a direct equal but opposite relation between the coefficient of thermal expansion (CTE) value of a diffraction grating and the refractive index value of air at column 3, lines 20-21 (which recites a coefficient of thermal expansion (CTE) value of a diffraction grating to be 0.55×10^{-6}/°C) and column 3, lines 37-38 (which recites a refractive index value of air of -2.6×10^{-7}/°C). However, these values are clearly not equal but opposite, even in an approximate manner. Thus, it is respectfully submitted that Keyworth et al. and/or

Ogusu et al., either alone or in combination, fail to claim, disclose, or even suggest the claimed invention.

Regarding claim 8, the arguments presented above with respect to claim 1 apply.

Regarding claims 4-6 and 11-13, these claims are dependent upon independent claims 1 and 8, respectively. Thus, since independent claims 1 and 8 should be allowable as discussed above, claims 4-6 and 11-13 should also be allowable at least by virtue of their dependency on independent claim 1. Moreover, these claims recite additional features which are not claimed, disclosed, or even suggested by the cited references taken either alone or in combination. For example, claims 4 and 11 are each directed to the lens assembly being constructed of a material that is chosen to minimize its variance in focal length over temperature. The Examiner refers to column 2, lines 33-41, of Keyworth et al. and column 1, lines 5-12, of Ogusu et al. as teachings of this feature, but these references do not discuss anything with regard to minimizing focal length variance over temperature. Also, claims 5 and 12 are each directed to the lens assembly having a change of index of refraction with temperature from 0 to -2.5 PPM/degree Celsius. The Examiner refers to column 2, lines 33-37, of Ogusu et al. as a teaching of this feature, but this reference does not discuss anything with regard to a

lens assembly having a change of index of refraction with temperature from 0 to -2.5 PPM/degree Celsius. Further, claims 6 and 13 are each directed to the diffraction grating having a coefficient of thermal expansion of 0.5 PPM/degree Celsius to 1.5 PPM/degree Celsius. The Examiner refers to column 3, line 20, of Keyworth et al. as a teaching of this feature, but this reference does not discuss anything with regard to a diffraction grating having a coefficient of thermal expansion of 0.5 PPM/degree Celsius to 1.5 PPM/degree Celsius.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 1, 4-6, 8, and 11-13 be withdrawn.

IV. THE OBVIOUSNESS REJECTION OF CLAIMS 2, 3, 9, AND 10

On pages 4-5 of the Office Action, claims 2, 3, 9, and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Keyworth et al. (U.S. Patent No. 6,134,359) in view of Ogusu et al. (U.S. Patent No. 5,799,118) and further in view of Jamieson (Thermal Effects in Optical Systems). This rejection is hereby respectfully traversed.

Claims 2, 3, 9, and 10 are dependent upon independent claims 1 and 8. Thus, since independent claims 1 and 8 should be allowable as discussed above, claims 2, 3, 9, and 10 should also

be allowable at least by virtue of their dependency on independent claims 1 and 8.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 2, 3, 9, and 10 be withdrawn.

V. THE OBVIOUSNESS REJECTION OF CLAIMS 7 AND 14

On pages 5-6 of the Office Action, claims 7 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Keyworth et al. (U.S. Patent No. 6,134,359) in view of Ogusu et al. (U.S. Patent No. 5,799,118) and further in view of Jamieson (Thermal Effects in Optical Systems) and Olivieri et al. (Analysis of Defocusing Thermal Effects in Optical Systems). This rejection is hereby respectfully traversed.

Claims 7 and 14 are dependent upon independent claims 1 and 8. Thus, since independent claims 1 and 8 should be allowable as discussed above, claims 7 and 14 should also be allowable at least by virtue of their dependency on independent claims 1 and 8. Moreover, these claims recite additional features which are not claimed, disclosed, or even suggested by the cited references taken either alone or in combination. For example, claims 7 and 14 are each directed to selecting values of a coefficient of thermal expansion of the structure and the change in index of

refraction with temperature of the lens assembly so that the length of the structure changes proportionally with the focal length of the lens assembly in response to temperature changes in the structure and lens assembly, whereby the lens assembly remains substantially focused in relation to the optical components. The Examiner refers to the abstract of Olivieri et al. as a teaching of this feature, but this reference does not discuss anything with regard to the length of a structure changing proportionally with the focal length of a lens assembly in response to temperature changes in the structure and lens assembly.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 7 and 14 be withdrawn.

VI. CONCLUSION

In view of the foregoing, it is respectfully submitted that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number, in order to expedite resolution of any issues and to expedite passage of the

present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0206, and please credit any excess fees to the same deposit account.

Respectfully submitted,

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APPENDIX A

1 (Currently Amended). A wavelength division multiplexer/demultiplexer (WDM) comprising:

a structure extending longitudinally from one end to another for supporting components of the WDM;

at least two optical components supported at the one end of the structure for transmitting and receiving optical signals;

a diffraction grating supported at the other end of the structure for diffracting ~~the~~ optical signals from the optical components;

a lens assembly supported by the structure and disposed between the optical components and the diffraction grating, the lens assembly having a focal length for focusing ~~the~~ optical signals in relation to the optical components; and

wherein the coefficient of thermal expansion of the diffraction grating is ~~a value chosen to be~~ approximately equal to a negative of a change of index of refraction with temperature of air.

2 (Original). The WDM of claim 1 wherein the structure has a first coefficient of thermal expansion and the lens assembly has a second coefficient of thermal expansion, and wherein the first and second coefficients of thermal expansion are approximately

equal.

3 (Original). The WDM of claim 1 wherein the structure has a coefficient of thermal expansion within 3 PPM/degree Celsius of a coefficient of thermal expansion of the lens assembly.

4 (Original). The WDM of claim 1 wherein the lens assembly is constructed of a material chosen to minimize its variance in focal length over temperature.

5 (Original). The WDM of claim 1 wherein the lens assembly has a change of index of refraction with temperature from 0 to -2.5 PPM/degree Celsius.

6 (Original). The WDM of claim 1 wherein the diffraction grating has a coefficient of thermal expansion of 0.5 PPM/degree Celsius to 1.5 PPM/degree Celsius.

7 (Previously Presented). The WDM of claim 1 wherein a coefficient of thermal expansion of the structure and the change in index of refraction with temperature of the lens assembly are values selected so that the length of the structure changes proportionally with the focal length of the lens assembly in

response to temperature changes in the structure and lens assembly, whereby the lens assembly remains substantially focused in relation to the optical components.

8 (Currently Amended). An optical network having a wavelength division multiplexer/demultiplexer (WDM) comprising:

a structure extending longitudinally from one end to another for supporting components of the WDM;

at least two optical components supported at the one end of the structure for transmitting and receiving optical signals;

a diffraction grating supported at the other end of the structure for diffracting ~~the~~ optical signals from the optical components;

a lens assembly supported by the structure and disposed between the optical components and the diffraction grating, the lens assembly having a focal length for focusing ~~the~~ optical signals in relation to the optical components; and

wherein the coefficient of thermal expansion of the diffraction grating is ~~a value chosen to be~~ approximately equal to a negative of a change of index of refraction with temperature of air.

9 (Original). The optical network of claim 8 wherein the

structure has a first coefficient of thermal expansion and the lens assembly has a second coefficient of thermal expansion, and wherein the first and second coefficients of thermal expansion are approximately equal.

10 (Original). The optical network of claim 8 wherein the structure has a coefficient of thermal expansion within 3 PPM/degree Celsius of a coefficient of thermal expansion of the lens assembly.

11 (Original). The optical network of claim 8 wherein the lens assembly is constructed of a material chosen to minimize its variance in focal length over temperature.

12 (Original). The optical network of claim 8 wherein the lens assembly has a change of index of refraction with temperature from 0 to -2.5 PPM/degree Celsius.

13 (Original). The optical network of claim 8 wherein the diffraction grating has a coefficient of thermal expansion of 0.5 PPM/degree Celsius to 1.5 PPM/degree Celsius.

14 (Previously Presented). The optical network of claim 8 wherein a coefficient of thermal expansion of the structure and the change in index of refraction with temperature of the lens assembly are values selected so that the length of the structure changes proportionally with the focal length of the lens assembly in response to temperature changes in the structure and lens assembly, whereby the lens assembly remains substantially focused in relation to the optical components.

IN THE DRAWINGS:

Please enter replacement Figures 5A-5D and 8 as provided in the Office Action response filed April 21, 2003.